



MCI CONSTRUCTORS, INC.

7649 Dynatech Court
Springfield, Virginia 22153Address replies to:
P.O. Box 2786
Springfield, Virginia 22152Telephone (703) 569-8010
TWX 710-831-0333 MCI ALE

CLIENT: Harris and Associates

PROJECT:

SUBMITTAL DATE:

SUBMITTAL NUMBER:

SPEC. SECTION:

EQUIPMENT DESCRIPTION: Operation and Maintenance Manuals
F.D. and I.D. Fans

STATUS: Approved for submittal as clarified

C.Q.C. REPRESENTATIVE:


 Brian J. Fleming

CLARIFICATIONS

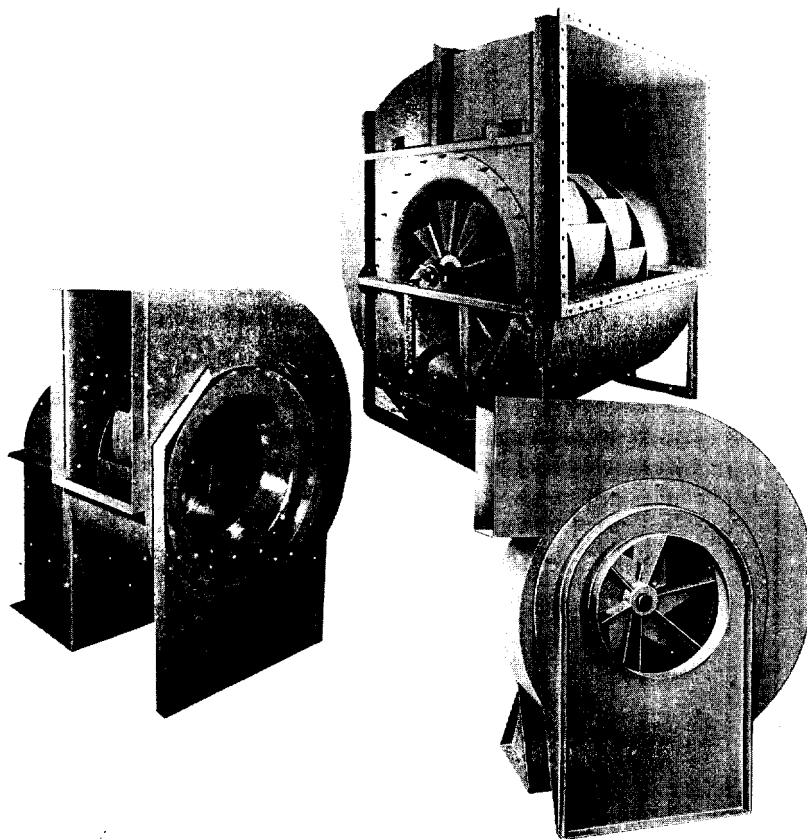
1. This submittal applies to the operation and maintenance manuals for the forced and induced draft fans.
2. This manual is in accordance with Specification Section 15010, Paragraph 26, and 01010 Paragraph 12. That is, the forced and induced draft fan section, General Mechanical divisions and the Summary of Work, respectively.

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30/01 Construction Administration Brian J. Fleming Harris and Associates Architects/Engineers Planners	Review only for conformance with the Contract documents and the Summary of Work, respectively.			
	The Contractor is responsible for dimensions, quantities, and materials specified at the site. The Contractor shall be solely responsible for the accuracy of the drawings, specifications, and quantities, and for coordinating all trades.			
	Not Approved - Resubmit			
	Date Chkd. By Arch. Struct. Mech.	Date Chkd. By Arch. Struct. Mech.		

INSTALLATION, **AIR TECHNOLOGY, INC.** OPERATION SUCCESSOR TO THE ASSETS OF and **CHAMPION BLOWER & FORGE INC.** MAINTENANCE INSTRUCTIONS



CHAMPION
BLOWER & FORGE, INC.

300 RICHARSON DRIVE, LANCASTER, PENN. 17603
100 W. CENTRAL, ROSELLE, ILLINOIS 60172

INTRODUCTION

Champion Blower & Forge, Inc. designs and manufactures equipment for the purpose specified. The receipt, handling, installation, maintenance, and safety precautions of such equipment is the responsibility of the purchaser. The fan which you have purchased, as a rotating piece of machinery, can become a source of danger to life, and can cause injury if not properly applied. Operating and Maintenance Personnel should be warned of the potential hazards. At no time should the maximum speed or operating temperature, for which the fan is designed, be exceeded.

It is advisable to have the installation and initial start up of the equipment supervised or checked by personnel experienced in such work and equipment. Personnel trained in such services are available at Champion Blower & Forge, Inc., and arrangements for such service can be made through your local representative, or at the Company's headquarters office.

These instructions are intended to supplement good erection techniques and are not to be considered as covering all possible conditions. Because of necessity, these instructions are general in nature.

SHIPMENT & RECEIVING

Champion Blower & Forge, Inc. has thoroughly inspected the equipment at its factory and prepared same for shipment in accordance with the uniform freight classification followed by all carriers. It should be in perfect condition when received, unless damaged in transit. Upon acceptance by the Carrier, as evidenced by a signed Bill of Lading, the Carrier accepts responsibility for all damage or shortages, whether concealed or evident. Claims covering shortages or damage must be made to the Carrier by the Purchaser. Any shortage or damage should be noted on the delivery receipt, and inspection should be requested by the Carrier for all damage, whether evident or concealed.

HANDLING

During unloading and handling, care must be exercised to prevent damage or distortion which may make installation difficult or affect the operation of the unit. The various parts are designed with sufficient strength for operating conditions, but when not unitized, may be damaged by rough handling.

Most fans are usually shipped completely assembled, on skids, or crated, as required. When moving or handling these units, good rigging techniques should be applied, avoiding any concentrated stresses that may distort any of the parts.

If necessity, some larger size fans are shipped partially or completely disassembled. The various components must be handled with extreme care. Particular attention must be given to fans with special coatings, as any damage to the coating will destroy the value of the coating.

The rotor assembly has been designed to be supported by the shaft, and should be lifted by slings around the shaft, as close as possible to the hub on each side of the wheel. Slings should not press against the side plates of the wheel, as this may damage and distort the wheel. A spreader bar should be used. The rotor should never rest on the side plates or blades, nor should the rotor be lifted by any components of the fan wheel. To do so may damage the rotor assembly, and destroy the dynamic balance that is necessary for vibration free operation.

If this balance is destroyed, rebalancing of the rotor assembly will be necessary. Normal eccentricities and runout of the rotating assembly have been factory inspected and are within commercial tolerances. They have no influence on balance or performance. If the wheel and shaft have not been assembled, the fan wheel may be lifted by a timber or wrapped bar passed through the hub. The finished bore of the hub must be protected from damage. Also the finished hub and bearing surfaces of the shaft must be protected from damage.

When handling the housing and other parts of this equipment, good rigging techniques should be applied. Avoid any concentrated stresses that will cause distortion and damage. Use of spreader bars is recommended.

STORAGE

Storage sites should be chosen on the basis of levelness and sturdiness to prevent undue stress or permanent unit distortion. Outside storage of equipment requires special methods of protection for bearings and rotating components against moisture, abrasives and corrosion. Fan wheels need not be secured to prevent wind rotation. Bearings should be completely filled with lubricant and then encased in water-repellent, lint-free jackets. The entire fan unit should be enclosed by tarps or plastic cover-all.

Equipment stored under such conditions requires periodic inspection to prevent deterioration, i.e., the oxidation of lubricants, paints or special service coatings, or the rusting of machine finished surfaces.

When fans are stored or warehoused for a period of time, bearings should be periodically rotated by hand and kept filled.

ERECTION INSTRUCTIONS

The dimensions and details of the fan base are shown on the customer's drawing which has been supplied. These should be

studied carefully. The fan should be mounted on a rigid and substantial foundation. Reinforced poured concrete is recommended. The foundation should be at least five to six times the weight of the fan it supports. It is desirable that the bottom of the foundation be longer and wider than the top. If sides are vertical, substantial footings are desirable. When designing foundations, at least 3/4" should be allowed for grouting.

Anchor bolts of suitable size, preferably in pipe sleeves to allow for minor bolt adjustment, should be accurately located before the concrete is poured. Allow 1" to 1-1/2" extra when determining bolt length to allow for grout, levelling, washers, nuts, etc.

If fans are to be installed above the ground, the same 5 to 1 ratio applies. A rigid support should be supplied sufficient to support the equipment and absorb any vibration that might develop. If possible, installation should be on or near walls, beams, or supporting columns.

INSTALLATION

UNITS SHIPPED COMPLETELY ASSEMBLED -

Remove skids and all other packing materials.

Move fan to its location and mount on foundation, on anchor bolts.

Level unit with a spirit level, by shimming as required.

Tighten nuts on anchor bolts, after installing flat and lock washers.

Grout unit if required.

UNITS SHIPPED PARTIALLY ASSEMBLED -

Because of shipping restrictions, units may be shipped with the lower half of the housing containing the wheel, shaft and bearing assembled as a unit, but with the top half of the housing removed. Items such as Motors, V-belt Drives, Dampers, etc. may be shipped separately.

Remove skids and all other packing materials.

Move lower half to its location and mount on foundation on anchor bolts.

Level unit with spirit level, by shimming as required.

Tighten nuts on anchor bolts, after installing flat and lock washers.

If motor is to be mounted, place motor in position on base, align, shim if necessary, and bolt down.

If V-belt drive is required, assemble sheaves to proper shafts and line up belts with proper tension.

Lower top half of housing onto bottom half of housing. Be careful not to damage either fan wheel and shaft, or inlet cone(s).

Install outlet damper if required.

Grout unit if required.

Duct work must be properly designed for efficient fan operation. For operation at temperature, or with spring isolation, flexible

expansion joints should be installed in both the inlet and outlet duct. Unless fan is specially designed for same, flues, ducts, silencers, etc., must not be supported by the fan housing. To do so may cause housing distortion and loss of proper running clearance between the fan wheel and inlet cones.

V-BELT DRIVES

The proper installation and alignment of V-belt Drives is very critical to proper fan operation. If drives have been installed at the factory they should be checked before operation. Place a straight edge or taut string across the faces of the sheaves to check alignment. The shafts of the fan and motor must be parallel. Belts must run straight. Check that keys are in keyways and that locking set screws are tight.

If drives have been shipped not mounted to fan, motor and fan shafts must be cleaned of all rust, dirt, burrs, nicks, grease, etc. Also the bores of the sheaves. Install fan and motor sheaves on the appropriate shafts. Install belts. Do not roll belts or force belts over the grooves with a tool. Instead, move motor so that belts can easily be installed. Align motor and fan shafts using a straight edge or taut string against the faces of the sheave. Shafts should be parallel. Check that keys are in keyways and sheave set screws are tight. Adjust belts by moving motor on its base. Use belt tension meter or check when running to see that a slight bow is on the slack side of belts. If belts squeal, this indicates slippage which should be eliminated by tightening belts. Be careful not to make belts too tight, as this could cause undue bearing wear. Variable speed sheaves are usually shipped from the factory at approximately the center of the speed range. The pitch should be varied only to change speed and never to adjust belt tension. Adjust belt tension by moving the motor on its base.

OPERATION OF EQUIPMENT

1. Check that bearings are properly aligned and lubricated, with special attention to the locking collars and set screws, cleanliness, and possible corrosion. Recommendations of bearing manufacturer should be followed concerning proper lubrication procedures. Bearing instructions are usually supplied with fans. If not received, or if lost, contact the factory for such instruction.
2. Check set screws and keys in wheel.
3. Check foundation bolts and other hardware for tightness.
4. Check housing, duct, etc., for foreign objects.
5. Check that all access doors are secure.
6. Recheck wheel/inlet cone clearance. Turn wheel by hand, make sure it rotates freely.

7. If equipped with damper or inlet volume controls, close same to lessen starting load on motor.
8. Bump unit to check for proper rotation.
9. Start unit. Follow instructions of motor and starter manufacturer.
10. Allow unit to come up to speed. Turn off. Check for any unusual noise or mechanical action. If any are noticed, locate and correct.
11. Recheck tightness of all set screws, keys, and hold down bolts. The initial start up will tend to relieve these and they may require re-tightening.
12. On sleeve bearings, check oil rings through inspection caps when unit is running. The rings should rotate freely and carry oil.

Once it has been determined that unit is operating satisfactorily, it should be operated, if practical, for at least eight hours. Operation should be monitored at least once each hour during this period. Check should be made for any change of operation during this period. Some bearings will have to "run in" and will heat up during this period. If the bare hand can be held on the bearing cap for five seconds, there is no cause for alarm.

MAINTENANCE

For trouble free operation and long life, frequent and regular checks should be made of the lubrication of bearings and couplings. These must be maintained and lubricated as recommended by the manufacturer.

At least three times a year the unit, and particularly the rotating parts, should be checked for wear. In dirty atmospheres, inspection should be more frequent, and particular attention should be paid to possible erosion.

In the event excessive vibration is noted, check for the following possibilities:

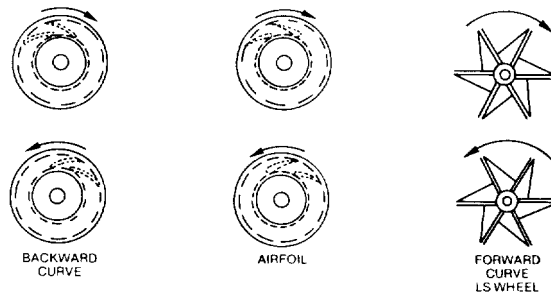
1. Build up of dirt on wheel.
2. Bolts loose on motor, housing or bearings.
3. Drives out of alignment or belts loose.
4. Improper bearing alignment or clearance.
5. Improper coupling alignment.
6. Wheel not tight on shaft.
7. Wheel, shaft and bearings are damaged from foreign object.
8. Is vibration from other than the fan?
9. Check clearance between wheel and inlet cones.

If the fan is to be idle and not operated for an extended period of time, bearings should be protected as recommended by the manufacturer. Shaft should be turned in the bearings at frequent intervals to prevent corrosion of the bearings. Exposed machined surfaces should be covered with a protective coating to prevent corrosion and damage.

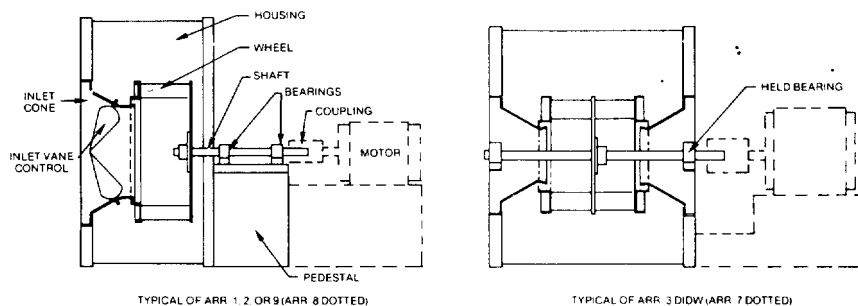
SPARE PARTS

Spare parts may be ordered from Champion Blower & Forge, Inc., by mentioning part name (wheel, shaft, bearings, etc.,) and the FAN SERIAL NUMBER. Due to the small number of parts which might require replacement, spare parts lists are neither necessary nor available.

WHEEL ROTATION VIEWED FROM DRIVE SIDE



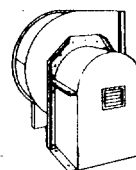
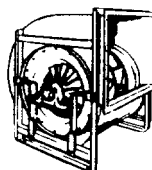
TYPICAL FAN ARRANGEMENTS



PRODUCT LINE

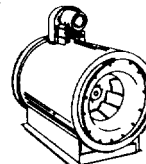
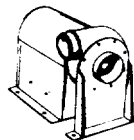
Approved For Release 2005/11/17 : CIA-RDP02-06298R000900050002-8

Design Eleven Centrifugal AirFoil Fans thru class 5 construction 22500 FPM tip speed. Built in 23 sizes and all arrangements.



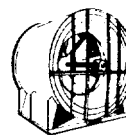
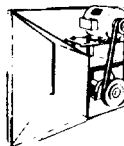
Vent-Pak available in sizes 122 thru 542 to 30 Inlet Vanes and most Centrifugal Fan Accessories available.

Cast-Iron Pak in 7 sizes complete with motors & drives. Special metal wheels and coatings available.



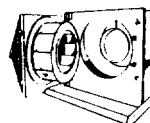
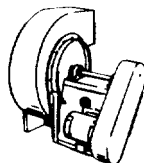
Tubular Centrifugal Fan. Built in 20 sizes through Class 3 construction. All accessories are available.

Plug-Pak built in 16 standard sizes 12 1/4 inch nominal wheel diameter thru 54 1/4 inch nominal wheel diameter. Units built thru Class III. Special motor and high temperature Plug-Paks available on application.



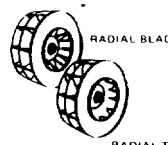
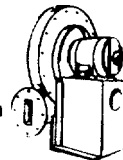
Champion-dryer inline fan in 23 sizes 122 through 1087. Three different discharge positions are available. Special metal wheels and coatings are also available.

Industrial Exhausters arrangement 1, 4, 9, 9H, 10 complete with all accessories to 84" wheel dia.



Quick access centrifugal airfoil fans built in 10 sizes 200 thru 490 to 50 HP. Provides easy access to fan interior for cleaning. Ideally suited for paint booth exhaust systems.

Turbaire Pressure Blower 4 thru 32 oz. pressure range to 100 hp arrangement 4. Special units available upon application.



Heavy duty fans on application. Both radial blade fans and radial tipped bladed fans can be furnished.



CHAMPION BLOWER & FORGE INC.

100 W. CENTRAL, ROSELLE, ILLINOIS 60172 • 312-529-2060
300 RICHARDSON DRIVE, LANCASTER, PENN., 17603 • 717-397-6171

SALES OFFICES IN ALL
PRINCIPAL CITIES

LICENSEES

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6647 P.E. LAMARCHE
MONTREAL 458, QUEBEC
CANADA

TECNICOS EN AIRE, S. DE R.L.
NUEVO LEON 22-3ER. PISO
APDO 40-127
MEXICO 11, D.F.

SOCIETA PER IMPIANTI GENERALI
VIALE LUNIGIANA, 23
MILANO, ITALY 20125

AERO SUPPLIES (PTE) LTD.
881-A BUKIT ROAD
SINGAPORE 1027

Approved For Release 2005/11/17 : CIA-RDP02-06298R000900050002-8

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8	Certification Data - F.D. Fan
9	Outline - TEFC Only 3205 FR-88-7S Drawing No. A-SS29277
10	Electric Motor Data - F.D. Fan
11	Performance Curve - F.D. Fan
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13	Circular Silencer Model CCB Drawing No. 5655/R1
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17	I.D. Fans - Size 402 Centrifugal Fan Assembly A/8 CCW/UB 90% SW - Drawing No. RD-11-0-645

Date Received

Document Control No.

General Certificate for drawings

Smith, J. H. & Co., Inc.
Engineers, 1000 15th St. N.W., Washington, D.C. 20005

This certificate is given to the contractor for the design and construction of the fan and its accessories in accordance with the specifications and drawings furnished by the contractor.

The contractor is responsible for dimensions to be maintained and corrected to the specifications and drawings furnished by the contractor. The contractor is responsible for the design and construction of the fan and its accessories in accordance with the specifications and drawings furnished by the contractor.

Approved

J. H. Smith

J. H. Smith

J. H. Smith

J. H. Smith

Arch.

Mech.

Elect.

Civil

Security

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Assembly ARR8

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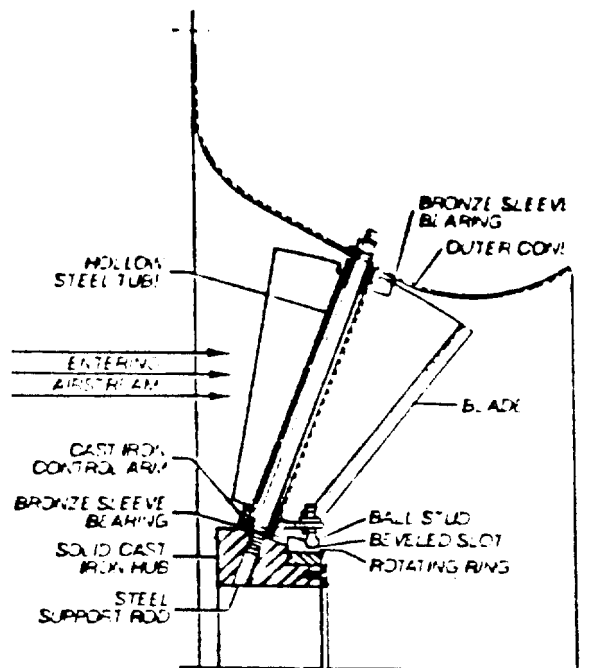
Assembly

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RESUBMITTAL



INLET VANE CONTROL is a nested vortex design. All components are located within the confines of the fan housing. The design utilizes heavy gauge blades. Each blade is welded to a hollow steel tube axle through which a solid steel support rod is housed. This rod provides a sturdy support between the outer cone and the cast iron center. Two bronze sleeve bearings are located within the hollow tube. Cast iron control arms with ball studs fit freely within the beveled slots of the rotating ring. The ball studs move with the rotating ring as it rotates around the center hub, causing the blades to open or close. The primary drive axle is linked to a solid steel torque shaft using a steel universal joint. This shaft penetrates the housing and is supported on a pedestal mounted flange ball bearing.

BEFORE OPERATING YOU MUST:

- 1) Check that IVC operates freely by hand, through the close-open-close cycle (Fan off.)
- 2) Set stops.
 - A. Adjust the "open" stop so that OPERATING CRANK only opens vanes 90°. Judge this angle by eye. (Some angular variation between individual vanes is inherent.)
 - B. Adjust the "closed" stop to limit OPERATING CRANK travel such that individual vanes just "kiss".
 - C. Then, if a DIDW fan, adjust length of ACTUATING LINK so that vanes on other IVC just "kiss" closed. The two IVC's are then synchronized.
 - D. LOCK STOPS (AND LINK)!! Repeat 1.

AFTER STARTUP:

If manual control is used, adjust IVC for required air flow and hold position with quadrant locking bolt.

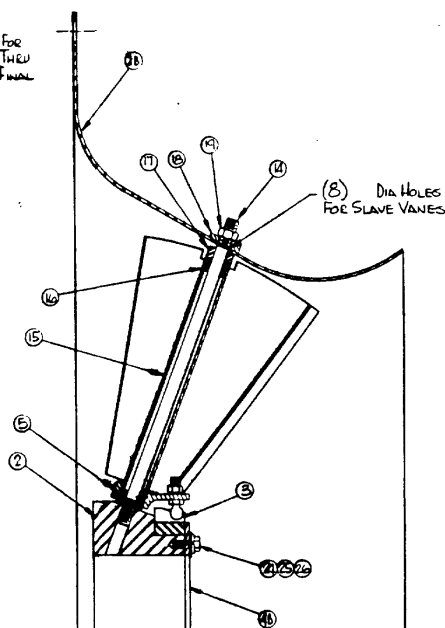
If automatic control is used, discard this bolt. Adjust controller linkage so no over-travel can occur. **SERIOUS INTERNAL DAMAGE** to IVC will result from over-travel.

If the fan is "under motored", amperage draw may be limited by setting the "OPEN" stop at something less than 90°. A tong ammeter will facilitate this setting.

MAINTENANCE

1. Check STOP adjustments periodically!
2. Lubricate external bearings at the same time as fan bearings.
3. No lubrication is required on internal parts, although they should be checked for wear, dirt build up and binding periodically.

DRILL $\frac{3}{8}$ " HOLE FOR
SHOULDER BOLT THRU
20 & 27 AFTER FINAL
ALIGNMENT




SECTION THRU SLAVE VANE
SHOWING ARRANGEMENT 3 TYPE APPLICATION

- 29 SET SCREW
- 28 INTERNAL CONTROL PLATE
- 21 TORQUE SLEAF
- 26 WASHER-FLAT
- 25 WASHER-LOCK
- 24 BOLT-HEX HO
- 23 NUT-HEX
- 22 SHOULDER BOLT
- 21 SET SCREW
- 20 UNIVERSAL JOINT
- 19 LOCK NUT
- 18 BEVELED WASHER
- 17 SET COLLAR
- 16 BRONZE BUSHING
- 15 SLAVE TUBE
- 14 SLAVE ROD
- 13 SET COLLAR
- 12 BEVELED WASHER
- 11 BRONZE BUSHING
- 10 MASTER TUBE
- 9 MASTER ROD
- 8 VANE
- 7 LOCK NUT
- 6 BALL STUD
- 5 CONTROL ARM
- 4B RETAINING PLATE A/B
- 4A RETAINING PLATE A/B
- 3 ROTATING RING
- 2 CENTER
- 1D INLET CONE A/B
- 1A INLET CONE A/B

SUCCESSOR TO THE ASSETS OF CHAMPION BLOWER & FORGE, INC.
MAILING: P. O. 72198
100 W. CENTRAL AVENUE
ROSELLE, ILLINOIS 60172

Purchaser to provide openings in building or structure of sufficient size to permit entrance of equipment parts as shown on this drawing.

This document contains material and/or information which is the property of Champion Blower & Forge, Inc., and supplied only on a confidential basis. No transmittal of this document to any other person, firm or corporation without the prior written approval of Champion Blower & Forge, Inc.

ITEM	PART NAME			
SIZE 7/8 #07	INLET VOLUME CONTROL ASSEMBLY			
	CHAMPION GLOWER & FORGE, INC. BOSTON, L.A., & NEW YORK CHAMPION, BOSTON (617) 552-1171			
QUANTITY	CERTIFIED BY	DATE	DRAWING NO.	REV
	NIS		per 9-2-	

IVC Adjustments

Normal adjustment consists of setting the quadrant stops to prevent overtravel. Overtravel will result in damage to the control. The stops should be set so that the vanes will just kiss when closed and open approximately 95%.

If the ball studs come out of the rotating ring, it will be necessary to reset the ring. To reset the ring, loosen all of the crank arms with the IVC closed, rotate the ring until the ball studs are just about to come out of the ring in the closed position. Hold the ball stud tight against the rotating ring opposite to the direction of travel and tighten the crank arms. Check that the ball studs do not bottom out on the rotating ring when opening the IVC. The ball stud is at its lowest position when the IVC is about $\frac{1}{2}$ open. If the ball stud bottoms out, raise the crank arm on the vane tube so that it just clears the ring.

If it becomes necessary to replace a vane busing or crank arm, care must be taken when tightening the rod nut. If it is over-tightened it will deform the cone and can cause wheel cone interference.

No lubrication is required on the rotating ring. If it becomes stiff it should be cleaned with a solvent. The use of oil or grease will attract a graphite or dry teflon lubricant may be used.